Imagine COMMUNICATIONS

Installation and Operation Manual

DA-S6802+DL / DA-SR6802+DL / DA-H6802+DL / DA-HR6802+DL

1×8 Looping Input SD/ASI Distribution Amplifiers / 1×8 Looping Input SD/ASI Distribution Amplifiers with Reclocking / 1×8 Looping Input 3 Gb/s, HD-SDI, SD-SDI, and ASI Distribution Amplifiers / 1×8 Looping Input 3 Gb/s, HD-SDI, SD-SDI, and ASI Distribution Amplifiers with Reclocking

Edition A

175-100071-00

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6800+

DA-S6802+DL: 1×8 Looping Input SD/ASI Distribution Amplifiers

DA-SR6802+DL:1×8 Looping Input SD/ASI Distribution Amplifiers with Reclocking

DA-H6802+DL: 1×8 Looping Input 3 Gb/s, HD-SDI, SD-SDI, and ASI Distribution Amplifiers

DA-HR6802+DL: 1×8 Looping Input 3 Gb/s, HD-SDI, SD-SDI, and ASI Distribution Amplifiers with Reclocking

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Installation and Operation Manual

Edition A
March 2009

Contents

Preface

Manual Information v
- Purpose v
- Audience v
- Revision History v
- Writing Conventions vi
- Obtaining Documents vi

Unpacking/Shipping Information vii
- Unpacking a Product vii
- Product Servicing vii
- Returning a Product vii

Safety Standards and Compliances viii
- Safety Terms and Symbols viii
- Restriction on Hazardous Substances (RoHS) Directive ix
- Waste from Electrical and Electronic Equipment (WEEE) Directive x

Chapter 1: Introduction

Product Description 1

Main Features 1
- DA-S6802✚DL 1
- DA-SR6802✚DL 2
- DA-H6802✚DL 2
- DA-HR6802✚DL 2

Back Modules 3

Signal Flow 4

Chapter 2: Installation and Operation

Installation Procedures 5
- Unpacking the Module 5
- Setting Jumpers 5
- Maximum 6800✚ Frame Power Ratings 6
- Installing 6800✚ Modules 7
- Making Connections 7

Operation 8
- Operating Notes 8
- Understanding Parameter Types 8

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Setting Locally Controlled Parameters 9
Setting Remotely Controlled Parameters 10
Recalling Default Parameter Settings 10
Reading Software and Hardware Versions 11
LEDs and Alarms 11
Module Status Indicator LED 11
Module-Specific LEDs 12
Alarms 13

Chapter 3: Specifications

Inputs 15
Outputs 16
Performance 17
Power Consumption 17
Temperature 17
Start-Up Time 17

Index

Keywords 19

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Preface

Manual Information

Purpose

This manual details the features, installation procedures, operational procedures, and specifications of the following distribution amplifiers:

- DA-S6802✚DL: 1×8 looping input SD/ASI distribution amplifiers
- DA-SR6802✚DL: 1×8 looping input SD/ASI distribution amplifiers with reclocking
- DA-H6802✚DL: 1×8 looping input 3 Gb/s, HD-SDI, SD-SDI, and ASI distribution amplifiers
- DA-HR6802✚DL: 1×8 looping input 3 Gb/s, HD-SDI, SD-SDI, and ASI distribution amplifiers with reclocking

Audience

This manual is written for engineers, technicians, and operators responsible for the installation, setup, and/or operation of the DA-S/SR/H/HR6802✚DL distribution amplifiers.

Revision History

Table P-1. Manual Revision History

Edition	Date	Revision History
A	March 2009	Initial release

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Writing Conventions

To enhance your understanding, the authors of this manual have adhered to the following text conventions:

Table P-2. Manual Style and Writing Conventions

Term or Convention	Description
Bold	Indicates dialog boxes, property sheets, fields, buttons, check boxes, list boxes, combo boxes, menus, submenus, windows, lists, and selection names.
Italics	Indicates email addresses, the names of books or publications, and the first instances of new terms and specialized words that need emphasis.
CAPS	Indicates a specific key on the keyboard, such as ENTER, TAB, CTRL, ALT, or DELETE.
`Code`	Indicates variables or command-line entries, such as a DOS entry or something you type into a field.
>	Indicates the direction of navigation through a hierarchy of menus and windows.
hyperlink	Indicates a jump to another location within the electronic document or elsewhere
Internet address	Indicates a jump to a website or URL
	Indicates important information that helps to avoid and troubleshoot problems.

Obtaining Documents

Product support documents can be viewed or downloaded from our website. Alternatively, contact your Customer Service representative to request a document.

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Unpacking/Shipping Information

Unpacking a Product

This product was carefully inspected, tested, and calibrated before shipment to ensure years of stable and trouble free service.

1. Check equipment for any visible damage that may have occurred during transit.
2. Confirm that you have received all items listed on the packing list.
3. Contact your dealer if any item on the packing list is missing.
4. Contact the carrier if any item is damaged.
5. Remove all packaging material from the product and its associated components before you install the unit.

Product Servicing

DA-S/SR/H/HR6802✚DL modules are not designed for field servicing. All hardware and firmware upgrades, modifications, or repairs require you to return the modules to the Customer Service center.

Returning a Product

In the unlikely event that your product fails to operate properly, please contact Customer Service to obtain a Return Authorization (RA) number, and then send the unit back for servicing.

Keep at least one set of original packaging, in the event that you need to return a product for servicing. If the original packaging is not available, you can purchase replacement packaging at a modest cost or supply your own packaging as long as it meets the following criteria:

- Withstands the weight of the product
- Holds the product rigid within the packaging
- Leaves at least two inches of space between the product and the container
- Protects the corners of the product

Ship products back to us for servicing prepaid and, if possible, in the original packaging material. If the product is still within the warranty period, we will return the product prepaid after servicing.

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Safety Standards and Compliances

See the *6800✚ Safety Instructions and Standards Manual* to find the safety standards and compliances for this 6800✚ series product. A safety manual is shipped with every host frame installation and operation manual and can be downloaded from our website. Alternatively, contact your Customer Service representative for a copy of this safety manual.

Safety Terms and Symbols

This product manual uses the following safety terms and symbols to identify certain conditions or practices. See the *6800✚ Safety Instructions and Standards Manual* for more information.

Table P-3. Safety Terms and Symbols

Symbol	Description
	WARNING Identifies conditions or practices that can result in personal injury or loss of life—high voltage is present. Uninsulated dangerous voltage within the product's enclosure may be sufficient to constitute a risk of electric shock to persons.
	CAUTION Identifies conditions or practices that can result in damage to the equipment or other property. Important operating and maintenance (servicing) instructions are included in the literature accompanying the product.

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Restriction on Hazardous Substances (RoHS) Directive

Directive 2002/95/EC—commonly known as the *European Union (EU) Restriction on Hazardous Substances (RoHS)*—sets limits on the use of certain substances found in electrical and electronic equipment. The intent of this legislation is to reduce the amount of hazardous chemicals that may leach out of landfill sites or otherwise contaminate the environment during end-of-life recycling. The Directive, which took effect on July 1, 2006, refers to the following hazardous substances:

- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Hexavalent Chromium (Cr-V1)
- Polybrominated Biphenyls (PBB)
- Polybrominated Diphenyl Ethers (PBDE)

In accordance with this EU Directive, products sold in the European Union will be fully RoHS-compliant and "lead-free." (See our website for more information.) Spare parts supplied for the repair and upgrade of equipment sold before July 1, 2006 are exempt from the legislation. Equipment that complies with the EU directive will be marked with a RoHS-compliant symbol, as shown in Figure P-1.

Figure P-1. RoHS Compliance Symbol

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Waste from Electrical and Electronic Equipment (WEEE) Directive

The *European Union (EU) Directive 2002/96/EC on Waste from Electrical and Electronic Equipment (WEEE)* deals with the collection, treatment, recovery, and recycling of electrical and electronic waste products. The objective of the WEEE Directive is to assign the responsibility for the disposal of associated hazardous waste to either the producers or users of these products. As of August 13, 2005, producers or users are required to recycle electrical and electronic equipment at end of its useful life, and must not dispose of the equipment in landfills or by using other unapproved methods. (Some EU member states may have different deadlines.)

In accordance with this EU Directive, companies selling electric or electronic devices in the EU will affix labels indicating that such products must be properly recycled. (See our website for more information.) Contact your local Sales representative for information on returning these products for recycling. Equipment that complies with the EU directive will be marked with a WEEE-compliant symbol, as shown in Figure P-2.

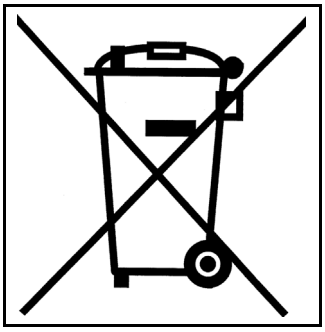

Figure P-2. WEEE Compliance Symbol

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Chapter 1

Introduction

Product Description

The DA-S/SR/H/HR6802✚DL series of distribution amplifiers are designed to process serial digital television signals according to SMPTE 257C, 292M, 424M, and DVI-ASI. They can also handle other bi-level data within amplitude and date rate limitation, such as 19.39 Mb/s and 38.78 Mb/s SSI. These distribution amplifiers feature high reliability, excellent video performance, and low cost.

The individual modules are available as follows:

- The DA-S6802✚DL is a 1×8 looping input SD/ASI distribution amplifier
- The DA-SR6802✚DL is a 1×8 looping input SD/ASI distribution amplifier with reclocking
- The DA-H6802✚DL is a 1×8 looping input 3 Gb/s, HD-SDI, SD-SDI, and ASI distribution amplifier
- The DA-HR6802✚DL is a 1×8 looping input 3 Gb/s, HD-SDI, SD-SDI, and ASI distribution amplifier with reclocking

You can control and monitor these distribution amplifier modules locally (via jumpers and card-edge LEDs) or remotely (via optional ICE6800✚ or 6800✚ETH Ethernet connection).

Main Features

DA-S6802+DL

- One input, eight non-reclocked outputs, one looping output
- Passive looping
- Handles data rates 540 Mb/s and below
- Input signal presence detect and report
- Automatic input cable equalization
- Card edge control by jumpers with LED display
- Remote control and monitoring via Ethernet

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DA-SR6802+DL

- One input, eight reclocked outputs, one looping output
- Passive looping
- Handles data rates 540 Mb/s and below
- Input signal presence detect and report
- Automatic input cable equalization
- Automatic reclocking 270 Mb/s SD or DVB-ASI
- Reclock status and rate report by LEDs
- Automatic bypass reclocking stage if not relockable
- Enforce bypass reclocker is available
- Card edge control by jumpers with LED display
- Remote control and monitoring via Ethernet

DA-H6802+DL

- One input, eight non-reclocked outputs, one looping output
- Passive looping
- Handles data rates 3.0 Gb/s and below
- Input signal presence detect and report
- Automatic input cable equalization
- Card edge control by jumpers with LED display
- Remote control and monitoring via Ethernet

DA-HR6802+DL

- One input, eight reclocked outputs, one looping output
- Passive looping
- Handles data rates 3.0 Gb/s and below
- Input signal presence detect and report
- Automatic input cable equalization
- Automatic and manual reclocking 270 Mb/s,1.485 Gb/s, 2.97 Gb/s, or DVB-ASI
- Reclock status and rate report by LEDs
- Automatic bypass reclocking stage if not relockable
- Enforce bypass reclocker is available
- Card edge control by jumpers with LED display
- Remote control and monitoring via Ethernet

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Back Modules

DA-S/SR/H/HR6802✚DL modules can be installed with double-width looping back modules in their host frames. These modules cannot be installed in 6800/7000 series frames.

Figure 1-1 shows the double-width looping back connector module used by the DA-S/SR/H/HR6802✚DL.

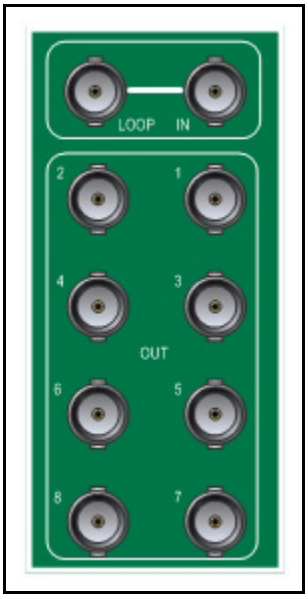

Figure 1-1. DA-S/SR/H/HR6802✚DL Double-Width Back Module

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Signal Flow

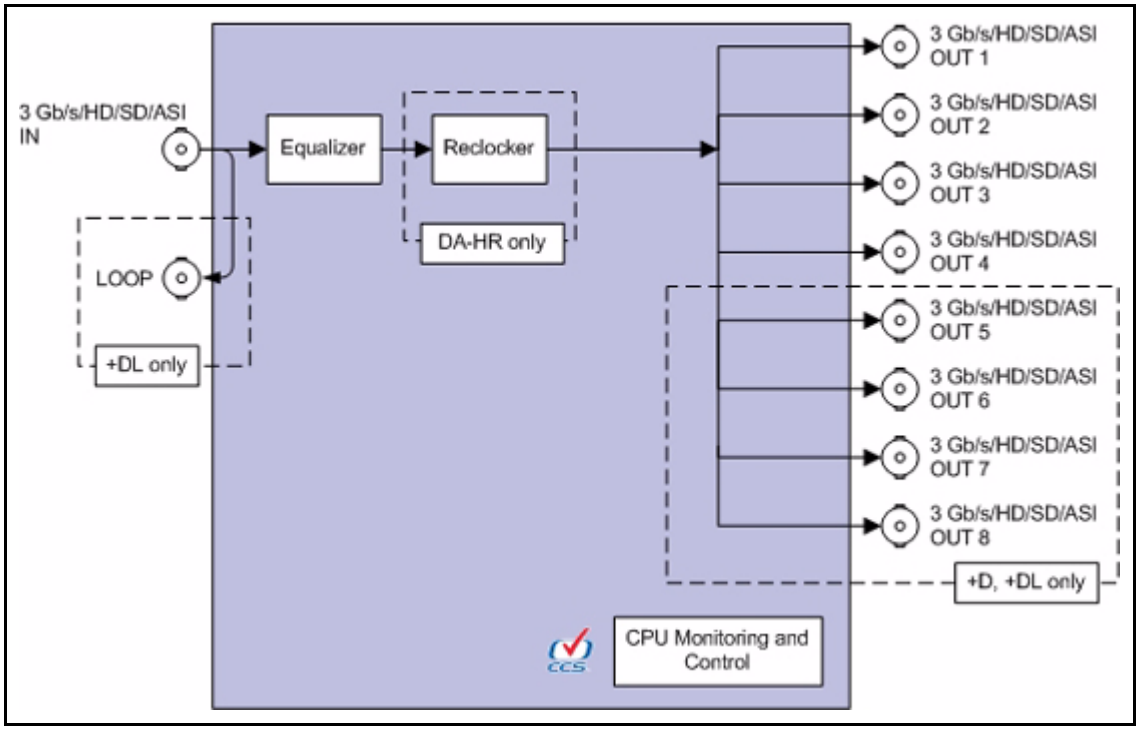

Figure 1-2. Signal Flow Diagram

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Chapter 2

Installation and Operation

Installation Procedures

Caution

Before installing this product, read the *6800✚ Series Safety Instructions and Standards* manual shipped with every host frame installation and operation manual, or downloadable from our website. This safety manual contains important information about the safe installation and operation of 6800✚ series products.

Unpacking the Module

Review "Unpacking/Shipping Information" on page vii before you install DA-S/SR/H/HR6802✚DL modules.

Setting Jumpers

You need to configure modules for local or remote operation *before* power-up.

You can use the J1 jumper to select local control reclock setting or to select remote control operation. See Figure 2-1 for a close-up view of the J1 jumper set. Table 2-2 on page 9 shows the possible local reclocking mode parameters.

Follow this procedure to set the jumpers:

1. Locate the J1 jumper set on the module.
2. Place a shunt on the pin that corresponds to the mode that you want.

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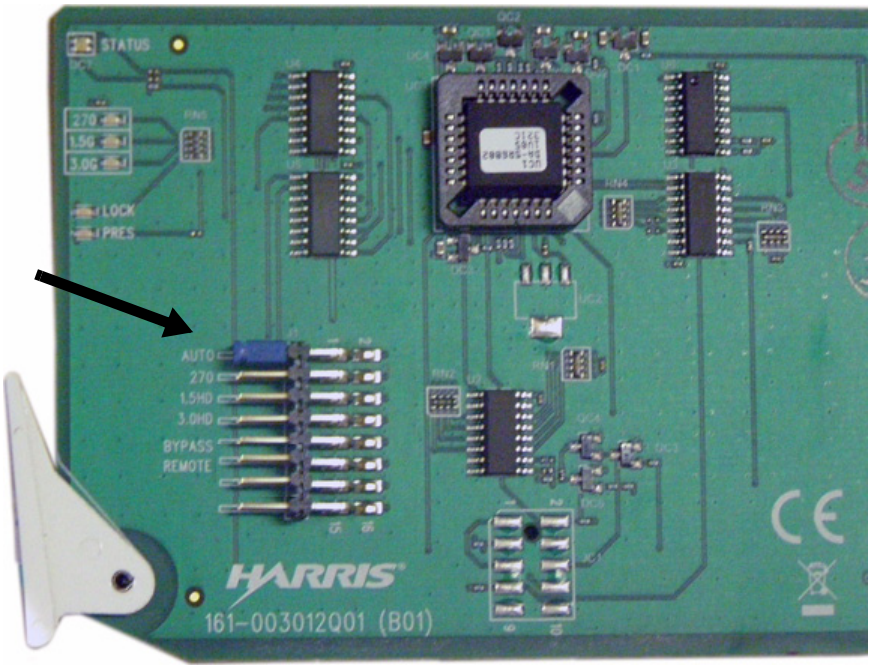

Figure 2-1. J1 Jumper Set Location

Maximum 6800+ Frame Power Ratings

Power consumption information is listed in Chapter 3: "Specifications" on page 17.

Table 2-1 describes the maximum allowable power ratings for 6800✚ frames. Note the given maximums before installing any 6800✚ modules in your frame.

DA-S/SR/H/HR6802✚DL modules can be installed in FR6802✚ or FR6822✚ frames. They cannot be installed in 6800/7000 series frames.

Table 2-1. Maximum Power Ratings for 6800✚ Frames

6800✚ Frame Type	Max. Frame Power Dissipation	No. Usable Slots	Max. Power Dissipation Per Slot
FR6802✚XF (frame with AC power supply)	120 W	20	6 W
FR6802✚XF48 (frame with DC power supply)	105 W	20	5.25 W
FR6802✚QXF (frame with AC or DC power supply)	120 W	20	6 W
FR6822✚ (frame with AC or DC power supply)	120 W	20	6 W

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Installing 6800+ Modules

Back Module Types

The DA-S/SR/H/HR6802✚DL modules have double-width back modules (see Figure 1-1 on page 3). See the host frame installation and operation manual for details on back module installation.

Installing Modules

These modules require no specialized installation or removal procedures. See the host frame installation and operation manual for information about installing and operating a frame and its components, or for removing components from a frame.

These modules cannot be installed in 6800/7000 series frames.

Making Connections

Once you have installed the module, you can connect it to the appropriate input and outputs.

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Operation

Operating Notes

When you change a control parameter on a DA-S/SR/H/HR6802✚DL module, the effect is immediate. However, the module requires up to 20 seconds to save the latest change. After 20 seconds, the new settings are saved and will be restored if the module loses power and must be restarted.

Understanding Parameter Types

Most module parameters are adjustable, and can be set via a CCS software application (see "Setting Remotely Controlled Parameters" on page 10 and "Recalling Default Parameter Settings" on page 10). However, there are some parameters that are considered "read-only" and cannot be changed. Indicated by the abbreviation "*[RO]*," these parameters provide status and feedback information only.

Harris recommends that you use the available 6800✚ software control options (serial/local or Ethernet/remote) to aid in viewing, setting, and confirming parameter values.

Adjustable Parameters

Two types of adjustable parameters can be changed. *Numerical* parameters require you to select a value within a numerical range. *Selectable* parameters require you to select a specific option. Both numerical and selectable parameter changes are immediate. Use the available 6800✚ software controls (serial/local or Ethernet/remote network) to view and monitor parameter selections.

Read-Only Parameters

These parameters provide status and feedback information only. They are represented by LEDs on the front of the module's card edge. See Figure 2-2 on page 11 and Figure 2-3 on page 12 for the location of these LEDs.

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Setting Locally Controlled Parameters

For local control, the J1 jumper is used to determine reclocking mode. Table 2-2 describes parameters that are accessible locally.

In the local control reclock setting operation mode, all of the settings' data status information appears on the CCS control software application control screen; however, you cannot change any setting in this mode via the CCS control software application.

Table 2-2. DA-SR6802✚DL and DA-HR6802✚DL Local Control Reclock Modes

Reclock Mode	Description
AUTO (Default)	Automatically detects the rate; if no selection rate jumper is selected, the selection will be AUTO
270	Forces reclocker to lock to a 270 Mb/s signal Set the jumper on the pin that allows the reclocker to handle 270 Mb/s data only • If 270 reclock mode is selected, the 270 Mb/s LED will turn on • If the module can successfully lock to the input, the lock LED will turn on • If reclocking is not successful, the lock LED will turn off and un-reclocked data will be present at output
1.5HD*	Forces reclocker to lock to a 1.485 Gb/s signal Set the jumper on the pin that allows the reclocker to handle 1.485 Gb/s data only • If 1.5HD reclock mode is selected, the 1.5 Gb/s LED will turn on • If the module can successfully lock to the input, the lock LED will turn on • If reclocking is not successful, the lock LED will turn off and un-reclocked data will be present at output
3.0HD*	Forces reclocker to lock to a 2.97 Gb/s signal Set the jumper on the pin that allows the reclocker to handle 2.97 Gb/s data only • If 3.0HD reclock mode is selected, the 3.0 Gb/s LED will turn on • If the module can successfully lock to the input, the lock LED will turn on • If reclocking is not successful, the lock LED will turn off and un-reclocked data will be present at output
BYPASS	Bypasses the reclocker
REMOTE	Selects remote control operation

* Operational on DA-HR6802✚DL modules only

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Setting Remotely Controlled Parameters

Table 2-3 describes parameters that are accessible remotely. Select remote control mode by setting the J1 jumper to "Remote." See your CCS control software application manual or online help for more information on setting and monitoring these parameters remotely.

Legend

Bold option=Indicates that this is the default setting for the parameter.

[RO]=Indicates that parameters are read-only/feedback, and cannot be used to select controls.

All parameters clip unless otherwise noted.

Table 2-3. DA-S/SR/H/HR6802✚DL Remotely Controlled Parameters

Name	Range	Description
Signal Present [RO]	• No • Yes	Indicates if input is present or not
Slew Rate	• **Auto** • SD • HD	Sets the output slew rate control
Serial Number	String	Displays the module's unique identifier
License Key	String	Activates options
Locked Data Rate [RO]	• Unknown • 270 Mb/s • Bypass Mode • 1.485 Gb/s HD • 2.97 Gb/s HD	Displays the data rate to which the module is locked
Reclocking Mode	• **Auto** • 270 Mb/s • Bypass Mode • 1.485 Gb/s HD • 2.97 Gb/s HD	Displays the data rate to which the module is forced to lock
Loss of Input Alarm	• **Disable** • Enable	Enables/disables Loss of Input alarm
Loss of Lock Alarm	• **Disable** • Enable	Enables/disables Loss of Lock alarm

Recalling Default Parameter Settings

You cannot recall default parameter settings for DA-S/SR/H/HR6802✚DL modules.

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Reading Software and Hardware Versions

The current software version of your DA-S/SR/H/HR6802✚DL module can only be viewed using a CCS-enabled control panel or a CCS software application. See your CCS software application user manual, or CCS software application online help for information on viewing software and hardware version numbers.

LEDs and Alarms

Module Status Indicator LED

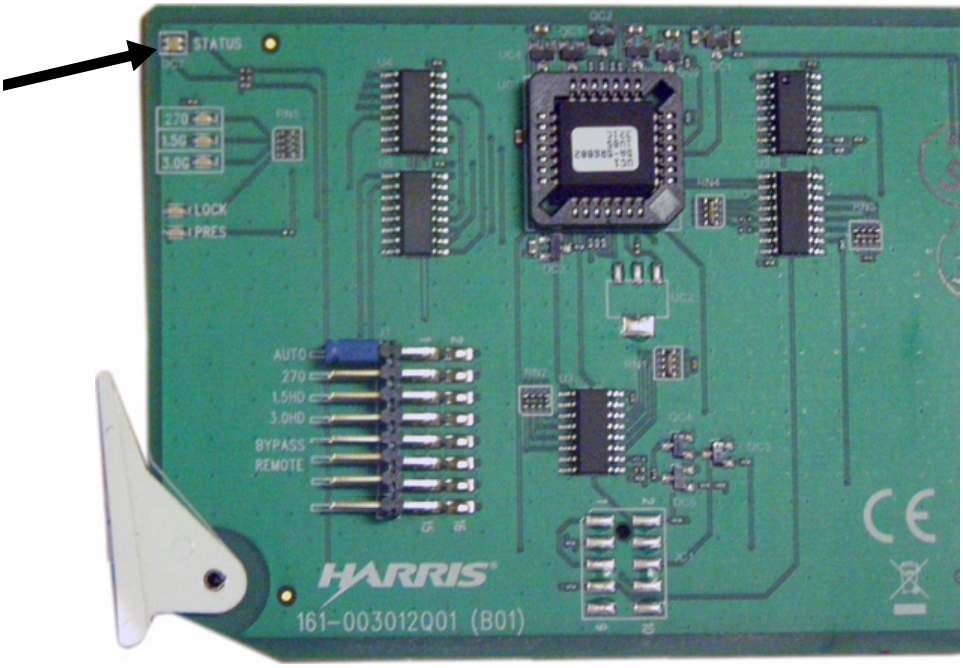

Figure 2-2. Module Status Indicator LED

A module status LED reports the state of the module. See Figure 2-2 for the location of this LED and Table 2-4 for a definition of the LED colors.

Table 2-4. Module Status Indicator LED Descriptions

LED Color Sequence	Meaning
Off	There is no power to the module; the module is not operational.
Green	There is power to the module; the module is operating properly.
Amber	There is an alarm condition.

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Module-Specific LEDs

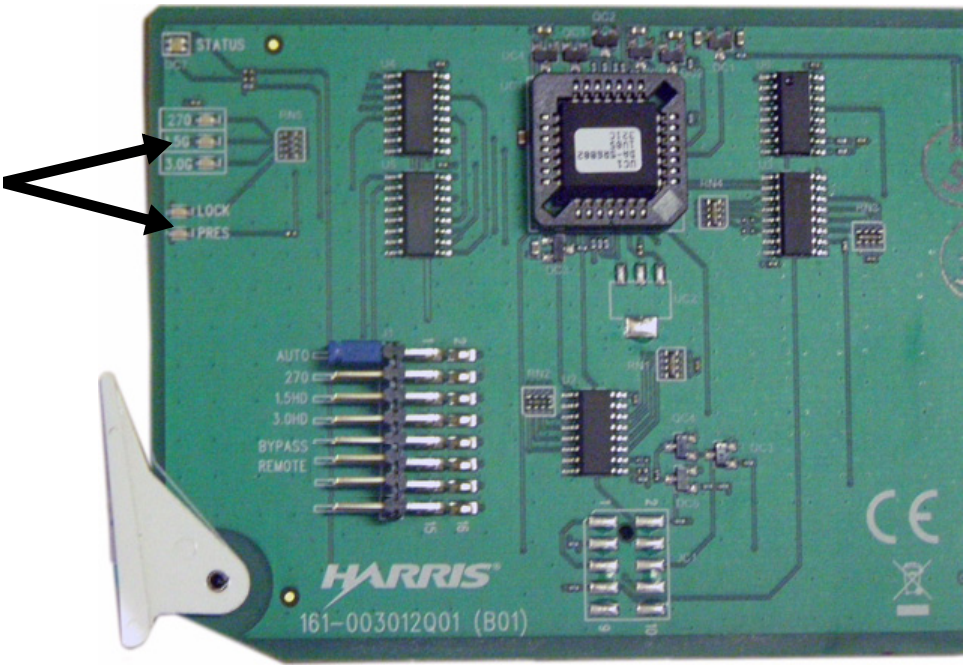

Figure 2-3. Module-Specific LEDs

Each 6800✚ module has a number of LEDs assigned to indicate varying states/functions. See Figure 2-3 for the location of these LEDs and Table 2-5 for their functions.

Table 2-5. Module-Specific Status LEDs

Name	Color	Function
PRES	Green	Input signal present
	Off	Input signal absent
LOCK*	Green	Signal locked
	Off	Signal cannot be locked
270*	Green	Input signal is relocked at 270 Mb/s
	Off	Input signal is not relocked at 270 Mb/s
1.5G†	Green	Input signal is relocked at 1.485 Gb/s
	Off	Input signal is not relocked at 1.485 Gb/s
3.0G†	Green	Input signal is relocked at 2.97 Gb/s
	Off	Input signal is not relocked at 2.97 Gb/s

* Operational on DA-SR6802✚DL and DA-HR6802✚DL modules only
† Operational on DA-HR6802✚DL modules only

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Alarms

If an alarm is triggered within your DA-S/SR/H/HR6802✚DL module, the Status LED will turn amber.

Alarms are usually logged and monitored within the available 6800✚ software control applications. See the appropriate software control user manual or online help for more information.

Table 2-6. Alarm Definitions

Alarm Name	Alarm Description	Alarm Level
Loss of input	Indicates input signal is lost or absent	Major
Loss of lock	Indicates signal is not locked	Major

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Chapter 3

Specifications

Specifications and designs are subject to change without notice.

Inputs

Table 3-1. Input Specifications

Item	Specification
Number of inputs	1
Signal type	3.0G*, HD*, SD, ASI
Connector	BNC per IEC169-8
Impedance	75Ω
Return loss	>15 dB 5 MHz to 1.5 GHz >10 dB 1.5 GHz to 3.0 GHz*
Maximum signal level	≥ 0.88 V
Cable equalization 270 Mb/s 1.5 HD-SDI 3.0 HD-SDI	 0–1,066 ft (0-325 m) Belden 1694A or equivalent 0–459 ft (0-140 m) Belden 1694A or equivalent* 0–230 ft (0-70 m) Belden 1694A or equivalent*

* DA-H6802✚DL and DA-HR6802✚DL only

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Outputs

Table 3-2. Output Specifications

Item	Specification
Number of outputs	8 reclocked 1 looping
Signal type	3.0G*, HD*, SD, ASI
Connector	BNC per IEC169-8
Impedance	75Ω
Return loss	>15 dB 5 Mhz to 1.5 GHz >10 dB 1.5 GHz to 3.0 GHz*
Signal amplitude	800 mV ± 10%
DC offset	0.0 V ± 0.5 V
Rise and fall time SD-SDI/ASI 1.5 HD-SDI 3.0 HD-SDI	 400-700 ps < 270 ps* < 135 ps*
Overshoot	< 10%
Reclocking	2.97 Gb/s*, 1.485 Gb/s*, 270 Mb/s

* DA-H6802✚DL and DA-HR6802✚DL only

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Performance

Table 3-3. Performance Specifications

Item	Specification
Jitter SD 1.5 HD 3.0 HD	 0.2 UI 0.2 UI 0.3 UI
Propagation	< 1.0 ns (for reference only)

Power Consumption

Power consumption for DA-S/SR/H/HR6802✚DL modules is < 6 W.

Temperature

Table 3-4. Temperature Specifications

Item	Specification
Performance	32° to 122°F (0° to 50°C)
Operating	41° to 113°F (5° to 45°C)

Start-Up Time

Module start-up time is approximately 3 seconds.

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Index

A

Adjustable parameters 8
Alarms
    configuring parameters 10
    definitions 13

B

Back connectors. *See* Back modules
Back modules 3, 7

C

Connections 7

D-E

Descriptions
    back modules 3
    LEDs 11–12
    product description 1
Directives
    Restriction on Hazardous Substances ix
    Waste from Electrical and Electronic Equipment x

F-G

Frames, compatible 6, 7

H

Hardware versions, reading 11

I

Input alarm 10, 13
Input specifications 15
Installation
    back modules 7
    jumpers 5
    making connections 7
    power ratings 6
    required frames 7
Introduction
    module descriptions
        back modules 3
    product description 1
    signal flow diagrams 4

J-K

Jumpers
    J1 5
    setting jumpers 5

L

LEDs
    descriptions 11–12
    module specific 12
    module status 11
Lock alarm 10, 13
Loss of Input Alarm parameter 10
Loss of Lock Alarm parameter 10

M-N

Manual information v–vi
Modules
    back modules 3, 7
    descriptions 1
    features 1–2
    jumpers 5
    LEDs
        module specific 12
        module status 11

O

Operation
    alarms
        configuring parameters 10
        definitions 13
    LEDs 11–12
    operating notes 8
    parameters

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lists 9–10
recalling settings 10
setting parameters 9–10
types 8
reading
hardware versions 11
software versions 11
Output specifications 16

P-Q

Parameters
adjustable 8
Loss of Input Alarm 10
Loss of Lock Alarm 10
read-only 8
recalling settings 10
remotely controlled 10
setting parameters 9–10
types 8
Performance specifications 17
Power consumption specifications 17
Power ratings 6
Power up time 17
Product description 1

R

Reading
hardware versions 11
software versions 11
Read-only parameters 8
Reclock modes 9
Remotely controlled parameter list 10
Restriction on Hazardous Substances (RoHS) directive ix

S

Safety
compliances viii
RoHS directive ix
standards viii
symbols viii
terms viii
WEEE directive x
Setting jumpers 5
Shipping information vii
Signal flow diagrams 4
Software versions, reading 11
Specifications
input 15
output 16
performance 17
power consumption 17
start-up time 17
temperature 17
Start-up time 17

T

Temperature specifications 17

U

Unpacking modules vii

V

Versions, reading hardware and software 11

W-Z

Waste from Electrical and Electronic Equipment (WEEE) directive x

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